Amendment to the Specification

Please amend the title of the invention appearing at page 1, lines 1-2, of the specification, as follows:

METHOD ~~AND KIT~~ FOR ENHANCING

THE ASSOCIATION RATES OF POLYNUCLEOTIDES

Amendments to the Claims

1. (Currently Amended) A method for forming a duplex from a polynucleotide probe and a target nucleic acid, said method comprising ~~the steps of~~ providing the following to a test sample:

~~providing said~~ a polynucleotide probe ~~to a test sample~~ under conditions permitting said probe to preferentially hybridize to ~~said~~ a target nucleic acid, if present, in said sample; ~~and~~

~~providing~~ a synthetic polycationic polymer ~~to said sample~~ in an amount sufficient to increase the association rate of said probe and said target nucleic acid in said sample under said conditions; and

a dissociating reagent to dissociate said polymer from said probe and said target nucleic acid.

2. (Original) The method of claim 1, wherein the cationic monomers comprising said polymer are in molar excess of the phosphate groups of said probe.

3. (Original) The method of claim 1, wherein said polymer is a copolymer.

4. (Original) The method of claim 1, wherein said polymer is a graft copolymer.

5. (Original) The method claim 1, wherein said polymer has a delocalized charge.

6. (Original) The method of claim 1, wherein the concentration of said polymer in said sample is in the range of about 10 μM to about 100 μM.

7. (Original) The method of claim 1, wherein said polymer has a weight average molecular weight of less than about 300,000 Da.

8. (Original) The method of claim 1, wherein said probe includes multiple interacting labels and comprises first and second base regions which hybridize to each other under said conditions in the absence of said target nucleic acid, wherein said labels interact with each other to produce a first detectable signal when said probe is not hybridized to said target nucleic acid and a second detectable signal when said probe is hybridized to said target nucleic acid, and wherein said first and second signals are detectably different from each other.

9. (Original) The method of claim 8, wherein said probe includes a third base region which hybridizes to said target nucleic acid under said conditions, and wherein said third base region is distinct from said first and second base regions or said third base region partially or fully overlaps at least one of said first and second base regions of said probe.

10. (Original) The method of claim 1, wherein said probe is a polyanion.

11. (Original) The method of claim 10, wherein said probe further includes at least one of a cationic group and a nonionic group.

12. (Original) The method of claim 10, wherein the distance between adjacent cationic monomers of said polymer approximates the distance between adjacent phosphate groups of said probe and said target nucleic acid.

13. (Original) The method of claim 1, wherein said target nucleic acid comprises RNA.

14. (Original) The method of claim 13, wherein said RNA is ribosomal RNA.

15. (Original) The method of claim 13, wherein said RNA is messenger RNA.

16. (Original) The method of claim 1, wherein a complex comprising said polymer is formed in said sample under said conditions.

17. (Original) The method of claim 16, wherein said complex includes a plurality of polymers which are covalently linked.

18. (Original) The method of claim 16 wherein said complex includes polymers and polynucleotides which are covalently linked.

19. (Original) The method of claim 16, wherein said complex is water soluble.

20. (Original) The method of claim 1, wherein said probe and said polymer are in solution during the formation of said duplex.

21. (Original) The method of claim 1, wherein the association rate of said probe and said target nucleic acid under said conditions and in the presence of said polymer is at least about 2-fold greater than the association rate of said probe and said target nucleic acid under said conditions and in the absence of said polymer.

22. (Original) The method of claim 1, wherein the association rate of said probe and said target nucleic acid under said conditions and in the presence of said polymer is at least about 5-fold greater than the association rate of said probe and said target nucleic acid under said conditions and in the absence of said polymer.

23. (Original) The method of claim 1, wherein the association rate of said probe and said target nucleic acid under said conditions and in the presence of said polymer is at least about

10-fold greater than the association rate of said probe and said target nucleic acid under said conditions and in the absence of said polymer.

24. (Original) The method of claim 1, wherein the association rate of said probe and said target nucleic acid under said conditions and in the presence of said polymer is at least about 100-fold greater than the association rate of said probe and said target nucleic acid under said conditions and in the absence of said polymer.

25. (Original) The method of claim 1, wherein the association rate of said probe and said target nucleic acid under said conditions and in the presence of said polymer is at least about 1000-fold greater than the association rate of said probe and said target nucleic acid under said conditions and in the absence of said polymer.

26. (Cancelled)

27. (Currently Amended) The method of claim ~~26~~ 1, wherein said dissociating reagent is at least one of a polyanion or an anionic detergent.

28. (Original) The method of claim 1, wherein said conditions include a temperature of at least about 40°C and a salt concentration of at least about 5 mM monovalent cations or an equivalent salt concentration containing multivalent cations.

29. (Original) The method of claim 28, wherein said temperature is up to about 60°C.

30. (Original) The method of claim 1, wherein said conditions include a temperature of at least about 40°C and a salt concentration of at least about 150 mM monovalent cations or an equivalent salt concentration containing multivalent cations.

31. (Original) The method of claim 30, wherein said temperature is up to about 60°C.

32. (Original) The method of claim 1, wherein said polymer is provided to said sample before said probe.

33. (Original) The method of claim 1 further comprising determining whether said duplex has formed in said sample.

34. (Original) The method of claim 33, wherein said probe preferentially hybridizes to a target nucleic acid sequence contained in said target nucleic acid under said conditions and said determining step is diagnostic for the presence or absence of a virus or organism or members of a group of viruses or organisms in said sample.

35. (Original) The method of claim 34, wherein said probe stably hybridizes to one or more nucleic acid sequences present in said sample having at least a single base difference from said target nucleic acid sequence.

36. (Original) The method of claim 33, wherein said probe includes a label.

Claims 37-60 (Withdrawn)

Remarks

Claims 1-25 and 27-60 are presently pending in the subject application. Claims 37-60 were withdrawn from consideration by the Examiner's Office Action mailed on May 30, 2003.

Reconsideration and allowance are respectfully requested in view of the above amendments and the following remarks.

Claim 1 has been amended herein to incorporate the limitation of cancelled claim 26. Claim 26 previously recited providing to the sample a dissociating reagent to dissociate the polymer from the polynucleotide probe and the target nucleic acid. Applicants submit that the art of record fails to disclose or suggest providing to a sample a polycationic polymer and a dissociating agent to separate a polynucleotide probe and target nucleic acid which have complexed with a polycationic polymer. While the Examiner cites Horn *et al.* (U.S. Patent No. 6,645,175) as providing motivation for adding a dissociating reagent to a sample comprising a polycationic polymer and a target nucleic acid, Horn in fact teaches dissociating a "label probe" from a "hybrid complex" (*i.e.*, other nucleic acids) which comprises the label probe. *See* Horn at col. 9, lines 23-61. Therefore, Horn provides no motivation for modifying Steeg *et al.* (U.S. Patent No. 5,753,437) to include a dissociating reagent to separate nucleic acids from a polycationic polymer, since Horn only teaches separating complexed nucleic acids and Steeg suggests no reason for separating labeled probe from target nucleic acid in his method for determining NM23 RNA levels. *See* bridging paragraph at cols. 17 and 18 of Steeg. Further, Steeg does not teach complexing a polycationic polymer with nucleic acids present in a sample, as suggested by the Examiner, but rather discloses providing paraffin embedded tumor sections to polylysine coated microscopic slides. Thus, Applicants submit that the Examiner's rejections under 35 U.S.C. §§ 102(b) and 103(a) are rendered moot by Applicant's amendment herein. Accordingly, withdrawal of these rejections is respectfully requested.

Applicants wish to thank the Examiner for the courtesies extended during an in-person interview with Applicants' representative and the inventor of the subject application on August 5, 2003. Applicants note for the record that the Examiner's Interview Summary accurately reflects the matters discussed during the interview.